

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

1. (Previously Presented): A cationic dye of formula I



wherein

CAT⁺ is a cation selected from azine, xanthene, polymethine, styryl, azo, tetrazolium, pyrylium, benzopyrylium, thiopyrylium, benzothiopyrylium, thiazine, oxazine, triarylmethane, diarylmethane, acridine, quinoline, isoquinoline, and quaternized azafluorenone dyes,

Y⁻ is an anion selected from CAB⁻, FAP⁻, FAB⁻, and Im⁻,

CAB⁻ conforms to formula (II-1)

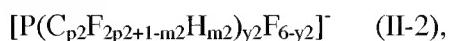


y1 is 1, 2, 3 or 4,

x1 is 0, 1, 2 or 3,

R⁰ is alkyl, aryl, fluorinated alkyl, fluorinated aryl, cycloalkyl or alkylaryl, with the condition that R⁰ may be hydrogen if y1 is >2,

FAP⁻ conforms to formula (II-2)

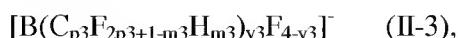


p2 is 1 to 20,

m2 is 0, 1, 2 or 3,

y2 is 1, 2, 3 or 4,

FAB⁻ conforms to formula (II-3)

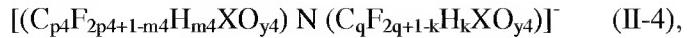


p3 is 1 to 20,

m3 is 0, 1, 2 or 3,

y3 is 1, 2, 3 or 4,

Im^- conforms to formula (II-4)



- X is carbon or sulfur,
p4 is 0 to 20 and $0 \leq \text{m}4 \leq 2\text{p}4+1$,
q is 0 to 20 and $0 \leq \text{k} \leq 2\text{q}+1$,
y4 is 1 or 2,
m4 is 0 if p4 is 0,
k is 0 if q is 0, and

the carbon atoms of the alkyl chain of the formula II-4 may be bonded to one another by single bonds, where the resultant alkylene chain may in turn be partially or fully substituted by F;

with the provisos that:

if X is sulfur, y4 is 2, and if X is carbon, y4 is 1 and p4 or q ≥ 1 , and

3,3'-diethoxyethyl-2,2'-thiadicarbocyanine trifluoromethyltrifluoroborate is excluded.

2. (Withdrawn): A dye according to Claim 1, wherein CAT^+ is a cation of an azine dye.
3. (Withdrawn): A dye according to Claim 1, wherein CAT^+ is a cation of a xanthene dye.
4. (Previously Presented): A dye according to Claim 1, wherein CAT^+ is a cation of a polymethine dye.
5. (Withdrawn): A dye according to Claim 1, wherein CAT^+ is a cation of a styryl dye.
6. (Withdrawn): A dye Dyes according to Claim 1, wherein CAT^+ is a cation of an azo dye.

7. (Withdrawn): A dye according to Claim 1, wherein CAT⁺ is a cation of a tetrazolium dye.

8. (Withdrawn): A dye according to Claim 1, wherein CAT⁺ is a cation of a pyrylium dye.

9. (Withdrawn): A dye according to Claim 1, wherein CAT⁺ is a cation of a benzopyrylium dye.

10. (Withdrawn): A dye according to Claim 1, wherein CAT⁺ is a cation of a thiopyrylium dye.

11. (Withdrawn): A dye according to Claim 1, wherein CAT⁺ is a cation of a benzothiopyrylium dye.

12. (Withdrawn): A dye according to Claim 1, wherein CAT⁺ is a cation of a thiazine dye.

13. (Withdrawn): A dye according to Claim 1, wherein CAT⁺ is a cation of an oxazine dye.

14. (Withdrawn): A dye ~~Dyes~~ according to Claim 1, wherein CAT⁺ is a cation of a triarylmethane dye.

15. (Withdrawn; Currently Amended): A dye according to Claim 1, wherein CAT⁺ is a cation of a diarylmethane dye.

16. (Withdrawn): A dye according to Claim 1, wherein CAT⁺ is a cation of an acridine dye.

17. (Withdrawn): A dye according to Claim 1, wherein CAT⁺ is a cation of a quinoline dye.

18. (Withdrawn): A dye according to Claim 1, wherein CAT⁺ is a cation of an isoquinoline dye.

19. (Withdrawn): A dye according to Claim 1, wherein CAT⁺ is a cation of a quaternary azafluorenone dye.

20. (Previously Presented): A dye according to Claim 4, wherein CAT⁺ is a cation of a cyanine dye.

21. (Previously Presented): A dye according to Claim 4, wherein CAT⁺ is a cation of a carbocyanine dye.

22. (Previously Presented): A dye according to Claim 4, wherein CAT⁺ is a cation of an azacarbocyanine dye.

23. (Previously Presented): A dye according to Claim 4, wherein CAT⁺ is a cation of a diazacarbocyanine dye.

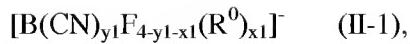
24. (Previously Presented): A dye according to Claim 4, wherein CAT⁺ is a cation of a triazacarbocyanine dye.

25. (Previously Presented): A dye according to Claim 4, wherein CAT⁺ is a cation of a hemicyanine dye.

26. (Previously Presented): A dye according to Claim 4, wherein at CAT⁺ is a cation of a diazahemicyanine dye.

27. (Withdrawn): A dye according to claim 1, wherein Y⁻ is a cyanoborate of

formula II-1



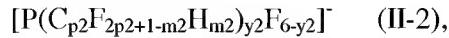
wherein

y1 is 1, 2, 3 or 4,

x1 is 0, 1, 2 or 3 and

R⁰ is alkyl, aryl, fluorinated alkyl, fluorinated aryl, cycloalkyl or alkylaryl, with the condition that R⁰ may be hydrogen if y1 is >2.

28. (Previously Presented): A dye according to claim 1, wherein Y⁻ is a fluoroalkylphosphate of the formula II-2



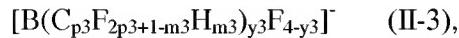
wherein

p2 is 1 to 20,

m2 is 0, 1, 2 or 3 and

y2 is 1, 2, 3 or 4 .

29. (Withdrawn): A dye according to claim 1, wherein Y⁻ is a fluoroalkylborate of formula II-3



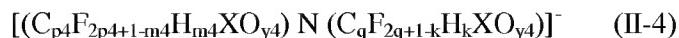
wherein

p3 is 1 to 20,

m3 is 0, 1, 2 or 3 and

y3 is 1, 2, 3 or 4.

30. (Withdrawn): A dye according to claim 1, wherein Y⁻ is an imide of the formula II-4



wherein

X is carbon or sulfur,

p4 is 0 to 20 and 0 ≤ m4 ≤ 2p4+1,

q is 0 to 20 and 0 ≤ k ≤ 2q+1,

- y4 is 1 or 2,
 m4 is 0 if p4 is 0, and
 k is 0 if q is 0,

with the proviso that

if X is sulfur, y4 is 2, and if X is carbon, y4 is 1 and p4 or q ≥ 1.

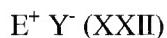
31. (Withdrawn): A process for the preparation of a cationic dye according to claim 1, said process comprising:

reacting a compound of formula XXI



wherein A⁻ is Cl⁻, Br⁻, I⁻, BF₄⁻, PF₆⁻, ClO₄⁻, sulfate, tosylate, hydrosulfate, triflate, trifluoroacetate, acetate or oxalate,

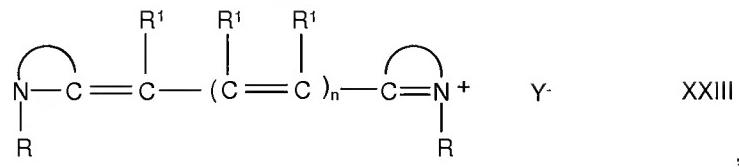
with a compound of formula XXII



wherein Y⁻ is CAB⁻, FAP⁻, FAB⁻ or Im⁻, and

E⁺ is a cation selected from cations of the alkali metals, alkaline earth metals or of a metal from group 11 and 12, ammonium, alkylammonium containing C₁-C₄-alkyl, phosphonium, alkylphosphonium containing C₁-C₄-alkyl, and/or guanidinium.

32. (Withdrawn): A process for the preparation of carbocyanine dye according to Claim 21, where the carbocyanine dye conforms to formula XXIII

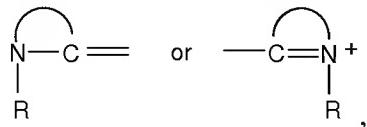


wherein

- n is 0, 1, 2, 3, 4 or 5,
 R in each case, independently of one another, is alkyl, alkenyl, cycloalkyl, aryl or heteroaryl,
 R¹ in each case, independently of one another, is H, Cl, Br, I, alkyl, partially or fully chlorinated alkyl, alkenyl, cycloalkyl, aryl, heteroaryl, Oalkyl, Oaryl, Salkyl, Saryl,
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NHalkyl, N(alkyl)₂, C(O)H, C(O)alkyl, C(O)aryl, CN, N=N-aryl, P(aryl)₂, NHC(O)alkyl or NHC(O)aryl and

the ring system, represented by

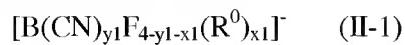


is a nitrogen-containing unsaturated mono-, bi- or tricyclic heterocycle having 5 to 13 ring members, which optionally contains 1, 2 or 3 N and/or 1 or 2 S or O atoms and the heterocyclic radical is optionally mono- or polysubstituted by Z,

Z is hydrogen, alkyl, NO₂, F, Cl, Br, I, OH, COOH, Oalkyl, SCN, SCF₃, COOalkyl, CH₂-COOalkyl, NH₂, NHalkyl or N(alkyl)₂

Y⁻ is an anion selected from CAB⁻, FAP⁻, FAB and Im⁻,

CAB⁻ conforms to formula (II-1)

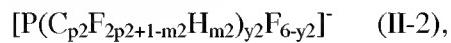


y1 is 1, 2, 3 or 4,

x1 is 0, 1, 2 or 3,

R⁰ is alkyl, aryl, fluorinated alkyl, fluorinated aryl, cycloalkyl or alkylaryl, with the condition that R⁰ may be hydrogen if y1 is >2,

FAP⁻ conforms to formula (II-2)

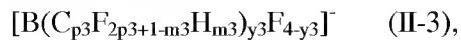


p2 is 1 to 20,

m2 is 0, 1, 2 or 3,

y2 is 1, 2, 3 or 4,

FAB⁻ conforms to formula (II-3)

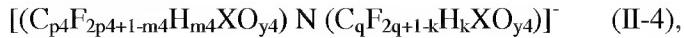


p3 is 1 to 20,

m3 is 0, 1, 2 or 3,

y3 is 1, 2, 3 or 4,

Im^- conforms to formula (II-4)



X is carbon or sulfur,

p4 is 0 to 20 and $0 \leq m4 \leq 2p4+1$,

q is 0 to 20 and $0 \leq k \leq 2q+1$,

y4 is 1 or 2,

m4 is 0 if p4 is 0,

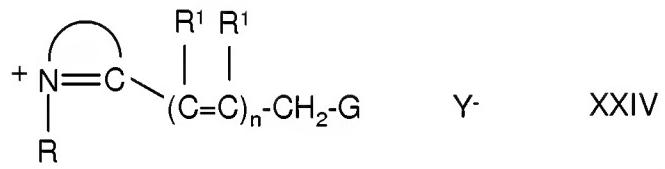
k is 0 if q is 0, and

the carbon atoms of the alkyl chain of the formula II-4 may be bonded to one another by single bonds, where the resultant alkylene chain may in turn be partially or fully substituted by F;

with the proviso that

if X is sulfur, y4 is 2, and if X is carbon, y4 is 1 and p4 or q ≥ 1 ,

said process comprising utilizing a compound of formula XXIV

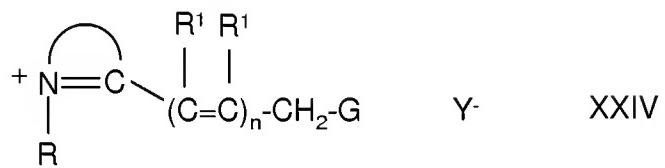


where the ring system, R, R¹ and Y⁻ have one of the meanings indicated in the case of formula XXIII, and

n is 0, 1, 2, 3 or 4 and

G is hydrogen, alkyl, alkenyl, aryl, heteroaryl, N=C(R)₂, CONHaryl, C(O)aryl or CONHalkyl.

33. (Withdrawn): A compound according to formula XXIV



where

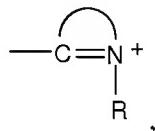
n is 0, 1, 2, 3 or 4,

G is hydrogen, alkyl, alkenyl, aryl, heteroaryl, N=C(R)₂, CONHaryl, C(O)aryl or CONHalkyl,

R is alkyl, alkenyl, cycloalkyl, aryl or heteroaryl,

R¹ is in each case, independently of one another, H, Cl, Br, I, alkyl, partially or fully chlorinated alkyl, alkenyl, cycloalkyl, aryl, heteroaryl, Oalkyl, Oaryl, Salkyl, Saryl, NHalkyl, N(alkyl)₂, C(O)H, C(O)alkyl, C(O)aryl, CN, N=N-aryl, P(aryl)₂, NHC(O)alkyl or NHC(O)aryl, and

the ring system, represented by

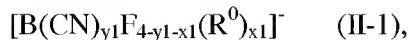


is a nitrogen-containing unsaturated mono-, bi- or tricyclic heterocycle having 5 to 13 ring members, optionally containing 1, 2 or 3 N and/or 1 or 2 S or O atoms and in which the heterocyclic radical is optionally mono- or polysubstituted by Z,

Z is hydrogen, alkyl, NO₂, F, Cl, Br, I, OH, COOH, Oalkyl, SCN, SCF₃, COOalkyl, CH₂-COOalkyl, NH₂, NHalkyl or N(alkyl)₂,

Y⁻ is an anion selected from CAB⁻, FAP⁻, FAB⁻ and Im⁻,

CAB⁻ conforms to formula (II-1)

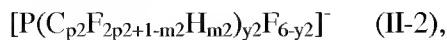


y1 is 1, 2, 3 or 4,

x1 is 0, 1, 2 or 3,

R⁰ is alkyl, aryl, fluorinated alkyl, fluorinated aryl, cycloalkyl or alkylaryl, with the condition that R⁰ may be hydrogen if y1 is >2,

FAP⁻ conforms to formula (II-2)

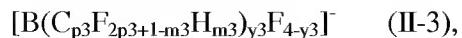


p2 is 1 to 20,

m2 is 0, 1, 2 or 3,

y2 is 1, 2, 3 or 4,

FAB⁻ conforms to formula (II-3)

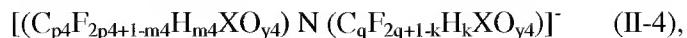


p3 is 1 to 20,

m3 is 0, 1, 2 or 3,

y3 is 1, 2, 3 or 4,

Im⁻ conforms to formula (II-4)



X is carbon or sulfur,

p4 is 0 to 20 and 0 ≤ m4 ≤ 2p4+1,

q is 0 to 20 and 0 ≤ k ≤ 2q+1,

y4 is 1 or 2,

m4 is 0 if p4 is 0, and

k is 0 if q is 0,

where the carbon atoms of the alkyl chain of the formula II-4 may be bonded to one another by single bonds, and the resultant alkylene chain may in turn be partially or fully substituted by F;

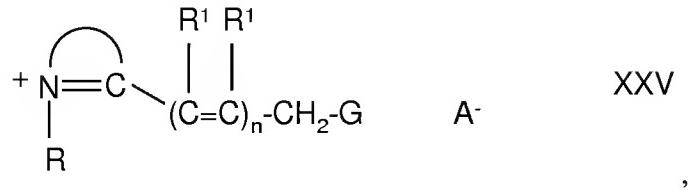
with the provisos that:

if X is sulfur, y4 is 2, and

if X is carbon, y4 is 1 and p4 or q ≥ 1.

34. (Withdrawn): A process for the preparation of a compound according to Claim 33, said process comprising reacting

a compound of formula XXV

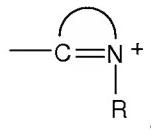


in which

A⁻ is Cl⁻, Br⁻, I⁻, BF₄⁻, PF₆⁻, ClO₄⁻, sulfate, tosylate, hydrosulfate, triflate,

trifluoroacetate, acetate or oxalate,

the ring system, represented by



is a nitrogen-containing unsaturated mono-, bi- or tricyclic heterocycle having 5 to 13 ring members, which optionally further contains 1, 2 or 3 N and/or 1 or 2 S or O atoms, and in which the heterocyclic radical is optionally mono- or polysubstituted by Z,

Z is hydrogen, alkyl, NO₂, F, Cl, Br, I, OH, COOH, Oalkyl, SCN, SCF₃, COOalkyl, CH₂-COOalkyl, NH₂, NHalkyl, or N(alkyl)₂,

n is 0, 1, 2, 3 or 4,

R is alkyl, alkenyl, cycloalkyl, aryl or heteroaryl,

R¹ is in each case, independently of one another, H, Cl, Br, I, alkyl, partially or fully chlorinated alkyl, alkenyl, cycloalkyl, aryl, heteroaryl, Oalkyl, Oaryl, Salkyl, Saryl, NHalkyl, N(alkyl)₂, C(O)H, C(O)alkyl, C(O)aryl, CN, N=N-aryl, P(aryl)₂, NHC(O)alkyl, or NHC(O)aryl, and

G is hydrogen, alkyl, alkenyl, aryl, heteroaryl, N=C(R)₂, CONHaryl, C(O)aryl, or CONHalkyl,

with a compound of formula XXVI

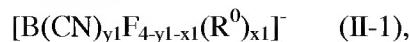


in which

E⁺ is a cation of the alkali metals, alkaline earth metals or of a metal from group 11 and 12, ammonium, alkylammonium containing C₁-C₄-alkyl, phosphonium, alkylphosphonium containing C₁-C₄-alkyl, or guanidinium,

Y⁻ is an anion selected from CAB⁻, FAP⁻, FAB⁻ and Im⁻,

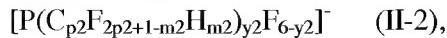
CAB⁻ conforms to formula (II-1)



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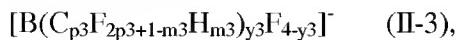
y_1 is 1, 2, 3 or 4,
 x_1 is 0, 1, 2 or 3,
 R^0 is alkyl, aryl, fluorinated alkyl, fluorinated aryl, cycloalkyl or alkylaryl, with
 the condition that R^0 may be hydrogen if y_1 is >2,

FAP^- conforms to formula (II-2)



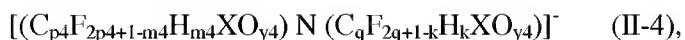
p_2 is 1 to 20,
 m_2 is 0, 1, 2 or 3,
 y_2 is 1, 2, 3 or 4,

FAB^- conforms to formula (II-3)



p_3 is 1 to 20,
 m_3 is 0, 1, 2 or 3,
 y_3 is 1, 2, 3 or 4,

Im^- conforms to formula (II-4)



X is carbon or sulfur,
 p_4 is 0 to 20 and $0 \leq m_4 \leq 2p_4+1$,
 q is 0 to 20 and $0 \leq k \leq 2q+1$,
 y_4 is 1 or 2,
 m_4 is 0 if p_4 is 0, and
 k is 0 if q is 0,

where the carbon atoms of the alkyl chain of the formula II-4 may be bonded to one another by single bonds, and the resultant alkylene chain may in turn be partially or fully substituted by F;

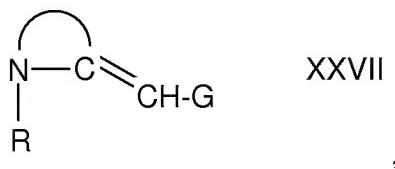
with the provisos that

if X is sulfur, y_4 is 2, and if X is carbon, y_4 is 1 and p_4 or $q \geq 1$.

35. (Withdrawn): A process for the preparation of a compound according to Claim 33, with the restriction that n in formula XXIV is 0, said process comprising:

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reacting a compound of the formula XXVII

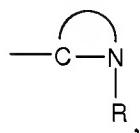


in which

G is hydrogen, alkyl, alkenyl, aryl, heteroaryl, $N=C(R)_2$, CONHaryl, C(O)aryl, or CONHalkyl,

R is alkyl, alkenyl, cycloalkyl, aryl or heteroaryl,

the ring system, represented by



is a nitrogen-containing unsaturated mono-, bi- or tricyclic heterocycle having 5 to 13 ring members, which optionally further contains 1, 2 or 3 N and/or 1 or 2 S or O atoms, and in which the heterocyclic radical is optionally mono- or polysubstituted by Z,

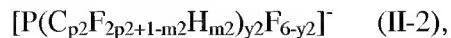
Z is hydrogen, alkyl, NO_2 , F, Cl, Br, I, OH, COOH, Oalkyl, SCN, SCF_3 , $COOalkyl$, $CH_2-COOalkyl$, NH_2 , NHalkyl, or $N(alkyl)_2$,

with a compound HY,

where

Y^- is an anion selected from FAP^- , FAB^- and Im^- ,

FAP^- conforms to formula (II-2)

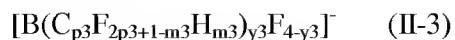


$p2$ is 1 to 20,

$m2$ is 0, 1, 2 or 3,

$y2$ is 1, 2, 3 or 4,

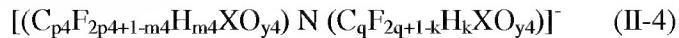
FAB^- conforms to formula (II-3)



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- p3 is 1 to 20,
- m3 is 0, 1, 2 or 3,
- y3 is 1, 2, 3 or 4,

Im^- conforms to formula (II-4)



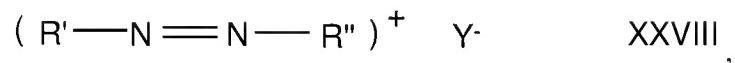
- X is carbon or sulfur,
- p4 is 0 to 20 and $0 \leq m4 \leq 2p4+1$,
- q is 0 to 20 and $0 \leq k \leq 2q+1$,
- y4 is 1 or 2,
- m4 is 0 if p4 is 0, and
- k is 0 if q is 0,

where the carbon atoms of the alkyl chain of the formula II-4 may be bonded to one another by single bonds, and the resultant alkylene chain may in turn be partially or fully substituted by F;

with the provisos that

if X is sulfur, y4 is 2, and if X is carbon, y4 is 1 and p4 or q ≥ 1 .

36. (Withdrawn): A process for the preparation of an azo dyes according to Claim 6, wherein said azo dye conforms to formula XXVIII

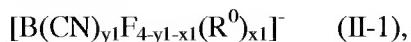


where

R' and R'' are each aryl or heteroaryl and one of the two aromatic nuclei is positively charged,

Y^- is an anion selected from CAB $^-$, FAP $^-$, FAB $^-$ and Im $^-$,

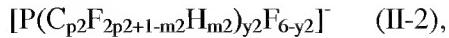
CAB $^-$ conforms to formula (II-1)



- y1 is 1, 2, 3 or 4,
- x1 is 0, 1, 2 or 3 and
- R^0 is alkyl, aryl, fluorinated alkyl, fluorinated aryl, cycloalkyl or alkylaryl, with

the condition that R⁰ may be hydrogen if y1 is >2,

FAP⁻ conforms to formula (II-2)

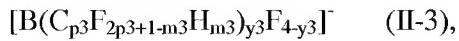


p2 is 1 to 20,

m2 is 0, 1, 2 or 3,

y2 is 1, 2, 3 or 4,

FAB⁻ conforms to formula (II-3)

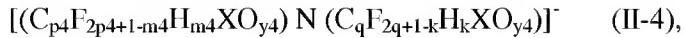


p3 is 1 to 20,

m3 is 0, 1, 2 or 3,

y3 is 1, 2, 3 or 4,

Im⁻ conforms to formula (II-4)



X is carbon or sulfur,

p4 is 0 to 20 and 0 ≤ m4 ≤ 2p4+1,

q is 0 to 20 and 0 ≤ k ≤ 2q+1,

y4 is 1 or 2,

m4 is 0 if p4 is 0, and

k is 0 if q is 0,

where the carbon atoms of the alkyl chain of the formula II-4 may be bonded to one another by single bonds, and the resultant alkylene chain may in turn be partially or fully substituted by F,

said process comprising reacting a compound of formula XXIX



where R' and Y⁻ has one of the meaning indicated in the case of formula XXVIII,

with an aromatic cyclic or heterocyclic compound R".

37. (Withdrawn): A compound according to formula XXIX

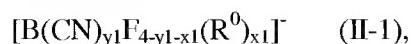


in which

R' is aryl or heteroaryl,

Y^- is an anion selected from CAB^- , FAP^- , FAB^- and $or Im^-$,

CAB^- conforms to formula (II-1)

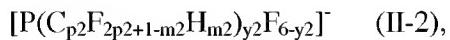


$y1$ is 1, 2, 3 or 4,

$x1$ is 0, 1, 2 or 3,

R^0 is alkyl, aryl, fluorinated alkyl, fluorinated aryl, cycloalkyl or alkylaryl, with the condition that R^0 may be hydrogen if $y1$ is >2,

FAP^- conforms to formula (II-2)

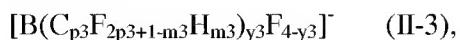


$p2$ is 1 to 20,

$m2$ is 0, 1, 2 or 3,

$y2$ is 1, 2, 3 or 4,

FAB^- conforms to formula (II-3)

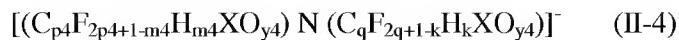


$p3$ is 1 to 20,

$m3$ is 0, 1, 2 or 3,

$y3$ is 1, 2, 3 or 4,

Im^- conforms to formula (II-4)



X is carbon or sulfur,

$p4$ is 0 to 20 and $0 \leq m4 \leq 2p4+1$,

q is 0 to 20 and $0 \leq k \leq 2q+1$,

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y4 is 1 or 2,
m4 is 0 if p4 is 0, and
k is 0 if q is 0,

where the carbon atoms of the alkyl chain of the formulae II-4 may be bonded to one another by single bonds, and wherein the resultant alkylene chain may in turn be partially or fully substituted by F;

with the provisos that

if X is sulfur, y4 is 2, and if X is carbon, y4 is 1 and p4 or q \geq 1.

38. (Withdrawn; Currently Amended): In a method of colouring plastics and plastic fibres, preparing for the preparation of flexographic printing inks, ball-point pen pastes, or stamp ink, coloring ~~colouring~~ leather and paper, preparing cosmetic formulations, or coloring in biochemistry, biology, medicine, analytics or electronics, the improvement wherein a dye according to claim 1 is used for coloring.

39. (Withdrawn): In a method of using a dye in data acquisition systems, reprography, in ink microfilters, in photogalvanics, laser technology or the photo industry, the improvement wherein said dye is a dye according to claim 1.

40. (Withdrawn): In a method of using a dye for CD recorders, DVD recorders (DVD+R, DVD+RW), Bluray disc (BD-ROM, BD-R, BD-RE), computer to plate, laser filters, laser marking or photopolymerisation, the improvement wherein said dye is a dye according to claim 1.

41. (Previously Presented): A dye according to Claim 28, wherein CAT⁺ is a cation of a polymethine dye.

42. (Previously Presented): A dye according to Claim 28, wherein p2 is 1, 2, 3, 4, 5, 6, 7 or 8.

43. (Previously Presented): A dye according to Claim 28, wherein p2 is 2, 3 or 4.

44. (Previously Presented): A dye according to Claim 28, wherein Y⁻ is
PF₃(C₂F₅)₃, PF₃(C₄F₉)₃, PF₃(C₃F₇)₃ or PF₄(C₂F₅)₂.